We claim:

1. A method for fabricating a tapered optical coupling into a slab waveguide comprising:

providing a sputtering source;

providing at least one mask between said source and said mask;

disposing a tapered layer of material onto a substrate which includes a waveguiding layer by means of shadow deposition defined by said sputtering source and said at least one mask, said tapered layer extending in a first two dimensional plane and optically coupled to said waveguiding layer; and

photolithographically defining a second taper in said tapered layer, said second taper extending in a second two dimensional plane intersecting said first two dimensional plane.

2. The method of claim 1 where photolithographically defining a second taper in said tapered layer defines said second two dimensional plane so as to perpendicularly intersect said first two dimensional plane.

3. The method of claim 1 further comprising photolithographically defining a slab waveguide in said waveguiding layer simultaneously with photolithographically defining a second taper in said tapered layer.

4. The method of claim 3 further comprising coupling said slab waveguide to a photonic crystal.

5. The method of claim 4 where coupling said slab waveguide to said photonic crystal comprises forming said slab waveguide integrally with said photonic crystal.

6. The method of claim 1 where disposing said tapered layer of material onto said substrate comprises disposing said tapered layer by means of shadow deposition defined by said sputtering source and said at least two masks.

7. The method of claim 1 where disposing said tapered layer of material onto said substrate comprises disposing polycrystalline silicon.

8. The method of claim 1 where disposing said tapered layer of material onto said substrate comprises disposing a material with an approximately matching refractive index to said waveguiding layer.

9. The method of claim 1 further comprising repeating said method on an opposing side of said substrate to form another tapered optical coupling on said opposing side aligned with said tapered optical coupling.

10. The method of claim 1 further comprising first forming a tapered substrate by means of shadow deposition and then forming said tapered optical coupling on said tapered substrate to obtain a fully flared, funnel-shaped, optical coupling.

11 A tapered optical coupling comprising:

a substrate;

a slab waveguide on or in said substrate; and

a funnel-shaped termination on or in said substrate and optically coupled to said slab waveguide.

12. The apparatus of claim 11 further comprising a photonic crystal and where said photonic crystal is optically coupled to said slab waveguide.

13. The apparatus of claim 12 where said slab waveguide is integral with said photonic crystal.

14. The apparatus of claim 11 further comprising an optic fiber and where said funnel-shaped termination is optically coupled to said optic fiber.

15. The apparatus of claim 11 where said funnel-shaped termination is formed by shadow deposition.

16. The apparatus of claim 11 where said funnel-shaped termination is composed of material having an index of refraction approximately matching said slab waveguide.

17. The apparatus of claim 16 where said funnel-shaped termination is composed of polycrystalline silicon.

18. The apparatus of claim 17 where said slab waveguide is composed of GaAs.

19. The apparatus of claim 11 where said funnel-shaped termination is a half-funnel shape.

20. The apparatus of claim 11 where said funnel-shaped termination is a full-funnel shape.

21. The apparatus of claim 11 where said funnel-shaped termination comprises a surface for optical coupling inclined with respect to said substrate.